

## ON THE BAKING PROPERTIES OF GOLIKOVSKA EMMER

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One of the known ways of improving the nutritive and biological value of bread products is the use of non-traditional raw materials that contain valuable sources of essential nutrients (protein, vitamins, dietary fibers, minerals, etc.). One of the advanced raw materials for the production of certain breads (e.g. corn bread) is emmer.

Emmer (*Triticum diccocom Schrank*) is an ancient wheat with a high protein content. Emmer was used as a cereal crop, since the production of emmer flour was found to be inefficient. This is due to strong shells on the grains and the quality of the gluten; deemed unsatisfactory for bread making. In order to eliminate the shortcomings of emmer, researchers from the Plant production Institute n.a. V.Ya. Yuriev (Kharkiv, Ukraine) have bred a species variant known as Golikovska. The study of baking properties of this new emmer variety is therefore of interest.

The purpose of this investigation is to study baking properties of new emmer Golikovska species.

Two spring crops (emmer Golikovska and bread wheat Kharkivska 30) were used for investigation. Kharkivska 30 was chosen as a control because of its good adaptation for growth in the environment found throughout the Eastern steppes of Ukraine. It has also seen heavy use in bread production across Ukraine. Some baking characteristics (gluten content and its quality, enzymes activity and bread quality) were investigated. With the aim to compare baking quality of unprocessed grains (dry grains) and soaked, emmer and wheat grains were soaked in water at 20° C for 15 h and 18 h respectively.

The results of the investigation are presented on tables 1 and 2.

As is shown in the table 1 emmer Golikovska contains 46,6% more protein and 33,8% more wet gluten compared to bread wheat. Significant difference between protein and gluten content would relate both with protein properties and gluten water capacity. During the soaking process grains change their properties both emmer and wheat. The protein content decreases in emmer at 3,5% and in wheat at 3,0%, that could be related with long time of grain soaking. The gluten content decreases also both wet and dry forms. The long time of grains

contacting with water results to gluten relaxation at that this effect more noticeable for emmer.

*Table 1 – Comparative characteristics of emmer and wheat*

Index	Emmer Golikovska		Wheat Kharkivska 30	
	dry grain	wet grain	dry grain	wet grain
Protein, % DM	19,01	18,36	12,97	12,59
Characteristics of gluten:				
wet gluten content, %	31,3	29,0	23,4	21,8
dry gluten content, %	10,9	9,6	7,1	6,6
water capacity of gluten, %	186,7	201,3	173,5	184,3
gluten index	79	88	72	78

With the aim to observe the possibility of grain bread making from emmer laboratory examples was prepared. The grain was soaked at 20° C during 15 h for emmer and 18 h for wheat. After that grain was destructed and mixed with yeast, salt and water. The dough was fermented during 60 min. After that it was cut into pieces, proof between 30 and 40 min and baked. Results of the investigation of the physical and chemical properties of grain bread are presented on the table 2.

*Table 2 – Comparison of the physical and chemical properties of grain bread*

Index	Grain bread from emmer	Grain bread from wheat
Moisture, %	46,4	46.0
Tittrable acidity, N	3.2	3.0
Specific volume, cm <sup>3</sup> /g	2.0	1.8
Porosity, %	63	60

As is shown in table 2 the loafs from emmer characterizes by better specific volume (at 11.1%) and porosity (at 5.0%) comparatively with grain bread from emmer. That could be relates both with the higher gassing activity of emmer grain mass and its better gas retaining ability comparatively with wheat one. Therefore use of the Golikovska emmer could be advanced for grain bread production.